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CORRES CONTROL  
OUTGOING LTR NO

DOE ORDER 17001

94 RF 04222

**EG&G ROCKY FLATS****EG&G ROCKY FLATS INC**

ROCKY FLATS PLANT P O BOX 464 GOLDEN COLORADO 80402-0464 (303) 966 7000


April 12 1994

94 RF 04222

S R Grace  
Environmental Restoration Division  
DOE/RFOMINUTES FROM APRIL 4 1994 MEETING ON OPERABLE UNIT NO 2 SOIL VAPOR EXTRACTION  
PROGRAM PJL 013 94

EG&G Rocky Flats Inc is transmitting copies of minutes from a meeting held on April 4 1994 between the Department of Energy/Rocky Flats Office the Colorado Department of Health the Environmental Protection Agency and EG&G Rocky Flats The meeting was held to review the results of Pilot Testing at Test Site 1 under the Operable Unit No 2 Subsurface Interim Measure/Interim Remedial Action Soil Vapor Extraction program A meeting agenda is also attached Please transmit copies of the minutes and agenda to the Agencies

If you have any questions regarding the meeting minutes please contact R E Madel of Environmental Engineering & Technology at extension 6972

  
P J Laurin  
Operable Unit No 2 Manager  
Remediation Project Management

REM cet

Orig and 1 cc S R Grace

Attachments  
As Stated (2)DOCUMENT CLASSIFICATION  
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CC  
E A Dillé DOE/RFO  
R J Schassburger DOE/RFO

**ADMIN RECORD**

DIST	cc
AMARAL M E	
BERMAN H S	
BRANCH D B	
CARNIVAL G J	
COOP R D	
DAVIS J G	
FERREIRA D W	
HANNI B J	
HARMAN L K	
HEALY T J	
HEDAH T	
HILBIG J G	
HUCHINGS N M	
KELL R E	
KIRBY W A	
KUESER A W	
MAHAFFEY J W	
MANN H P	
MARX G E	
M DONALD M M	
M KENNA F G	
MONROSE J K	
MORGAN R V	
POTTER G L	
PIZZITO V M	
RISING T L	
SANDLIN N B	
SETLOCK G H	
STEWART D L	
STIGER S G	
SULLIVAN M T	
SWANSON E R	
WILKINSON R B	
WILSON J M	
WYANT R D	

*Busby, W S* X  
*Anderson, G M* X  
*Kie, M D* X  
*Laurin, P J* X  
*Huchings, N M* X  
*Madel, R E* X  
*Swanston, R B* X  
*P. Schassburger* X

CORRESP CONTROL x x  
ADMIN RECORD/080 ✓  
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PATS/T130G

CLASSIFICATION

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CONFIDENTIAL	
SECRET	

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IN REPLY TO REF CC NO

ACTION ITEM STATUS

☐ OPEN

☐ CLOSED

LTR PROVALS

ORIG TYPYST INITIALS

REF/m/cet

RF 6- (R 0/9)

## MINUTES

### REVIEW MEETING OU 2 EARLY SOIL VAPOR EXTRACTION PILOT TEST APRIL 4 1994

#### ATTENDERS.

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE #</u>
Bill Fraser	EPA	294 1081
Michael Klein	EG&G	966 6950
Pete Laurin	EG&G	966 8702
Robin Madel	EG&G	966 6972
Barry O Melia	WCFS	740 3974
Dean Parson	WCFS	740 3947
Jeff Swanson	CDH	692 3416

Meeting agenda is attached

Preliminary outline for the OU 2 SVE Pilot Test report is attached

#### Pilot Test Results To Date

73 pounds of VOCs removed/211 hours of operation  
most successful in the alluvium 1/2 to 1 pound VOCs per hour removed  
extraction rate is low in the sandstone (lots of dewatering is required)  
concentrate extended operations on alluvium  
only extracting on the North side of the trench  
want to extract on the South side of the trench  
convert south side injection well to extraction well  
carbon usage and waste issues are not a problem

#### Groundwater Pumping Issues

groundwater data summary table  
NAPL is being pulled down into the groundwater unit  
want to discontinue groundwater pumping until these issues can be addressed  
low numbers on the table are not from the same well as the high numbers (high and low values indicated)  
SV00394 best characterizes what is in the groundwater  
NAPL is in the capillary fringe haven't drilled through it  
TK water is from the tank  
original pump tests (RI program) 12 gallons per minute  
SVE pilot test (without vacuum) 4 gallons per minute  
SVE pilot test (with vacuum)  $\pm$  8 gallons per minute  
PCE is at 2 / solubility  
CCl<sub>4</sub> is close to 1 / solubility  
dewatering tests have only been run for 16 hours may not be long enough to dry out unit generating + 20 000 gallons of water may not be reasonable

objective of the test was to dewater run SVE then evaluate applicability (pilot tests 5 7 and 9)

can we treat water?

should we move NAPL into a clean water unit

do we go through all of this how much info will we really gain?

these issues need to be addressed on Thursday/Friday meetings

FID showed 7000 ppm/v from the sandstone dewatering higher than the other tests with minimal air flow could be stripping volatiles from the groundwater (5 7 of unsaturated sandstone)

#### Schedule

meet next week to review this info (with the EPA and CDH)

DOE/EG&G will still meet on Thursday and Friday with Battelle

meet this week and maybe next week

#### Proposed Modifications

continue extractions of alluvial unit

want to do six (6) weeks of extended operations in all

go back and do the groundwater pilot tests later

this affects the report delivery milestone (causes schedule problems)

CDH/EPA agreed to this strategy

revisit schedule in six (6) weeks evaluate what has been removed more data better data construct a model

EG&G letter to DOE proposing modifications

DOE letter to the agencies proposing modifications

# **AGENDA**

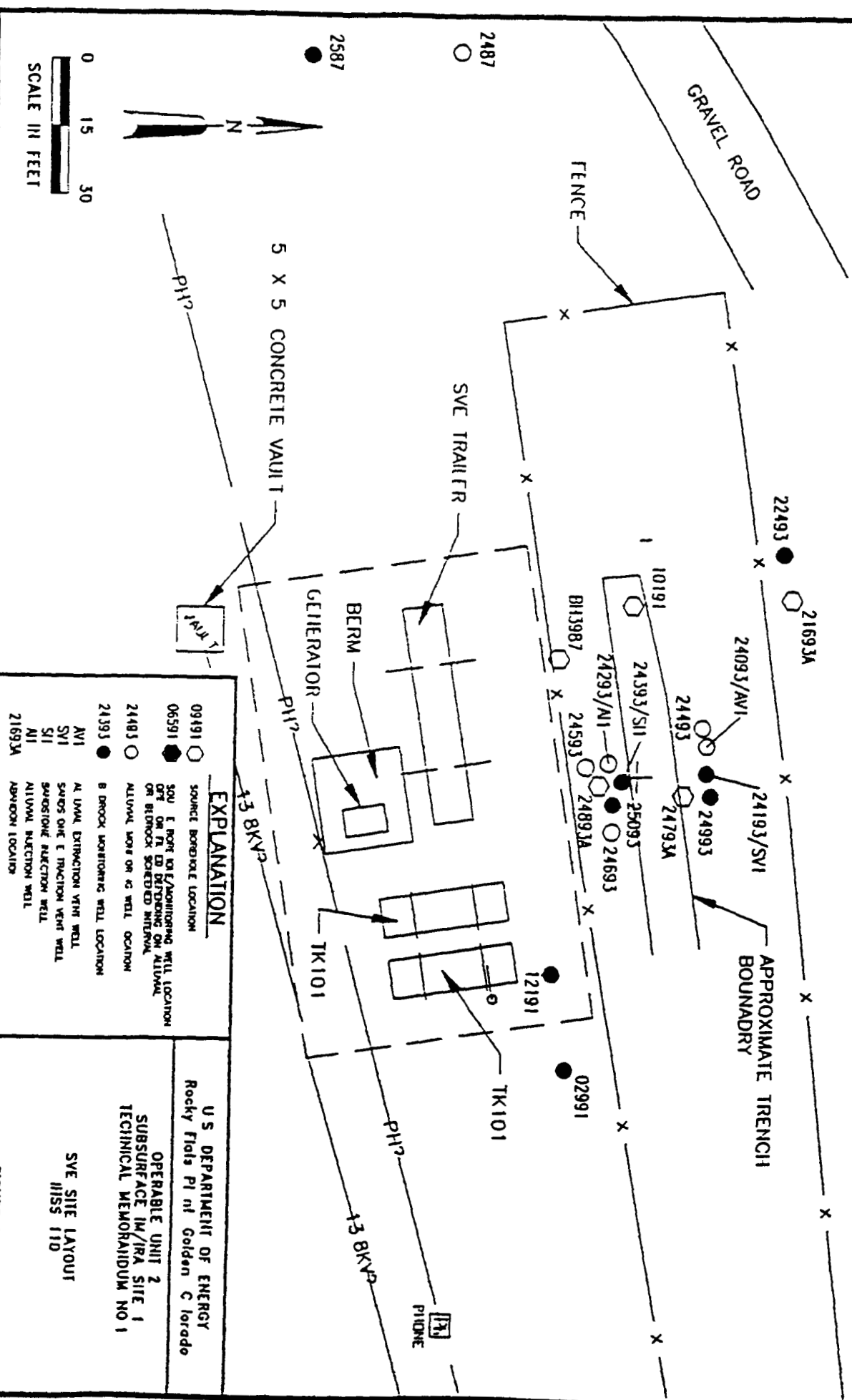
## **Review Meeting OU2 SVE Pilot Test April 4, 1994**

- Program Status
- Pilot Test Results to Date
  - Soil gas flowrates
  - Soil gas concentration
  - Groundwater flowrates
  - Groundwater concentration
- Groundwater Pumping Issues
- Proposed Injection Well Modifications
- Sustained Operations Test
- Technical Memorandum No 1 Review
- GAC Usage
- Pilot Test Report Outline

## **SVE Pilot Test Program**

- Pilot Test No 1 - Initial Vapor Treatment System Performance
- Pilot Test No 2 - Alluvium System Performance
- Pilot Test No 3 - Sandstone System Performance
- Pilot Test No 4 - Concurrent Groundwater Extraction and Sandstone System Performance
- Pilot Test No 5 - Concurrent Alluvium and Sandstone System Performance
- Pilot Test No 6 - Alluvium Passive Air Inlet Performance
- Pilot Test No 7 - Sandstone Passive Air Inlet Performance
- Pilot Test No 8 - Alluvium Forced Air Inlet Performance
- Pilot Test No 9 - Sandstone Forced Air Inlet Performance

BI14087



**EXPLANATION**

- 09491 ○ SOURCE BOREHOLE LOCATION
- 06591 ● YOU E. POINT ON EXHAUSTING WELL LOCATION OR T. ID. BOREHOLE ON ACTUAL OR BEDROCK SCHEDULED INTERVAL
- 24483 ○ ACTUAL WORK ON K. WELL LOCATION
- 24393 ● B. DRILL LOGISTICS WELL LOCATION
- AV1 ○ A. LUNA EXTRACTION VENT WELL
- SV1 ○ S. VENT ONE E. TRACTION VENT WELL
- SI1 ○ S. VENT ONE E. TRACTION VENT WELL
- AV1 ○ ACTUAL EXTRACTION WELL
- 21693A ○ AEROSOL LOCATION

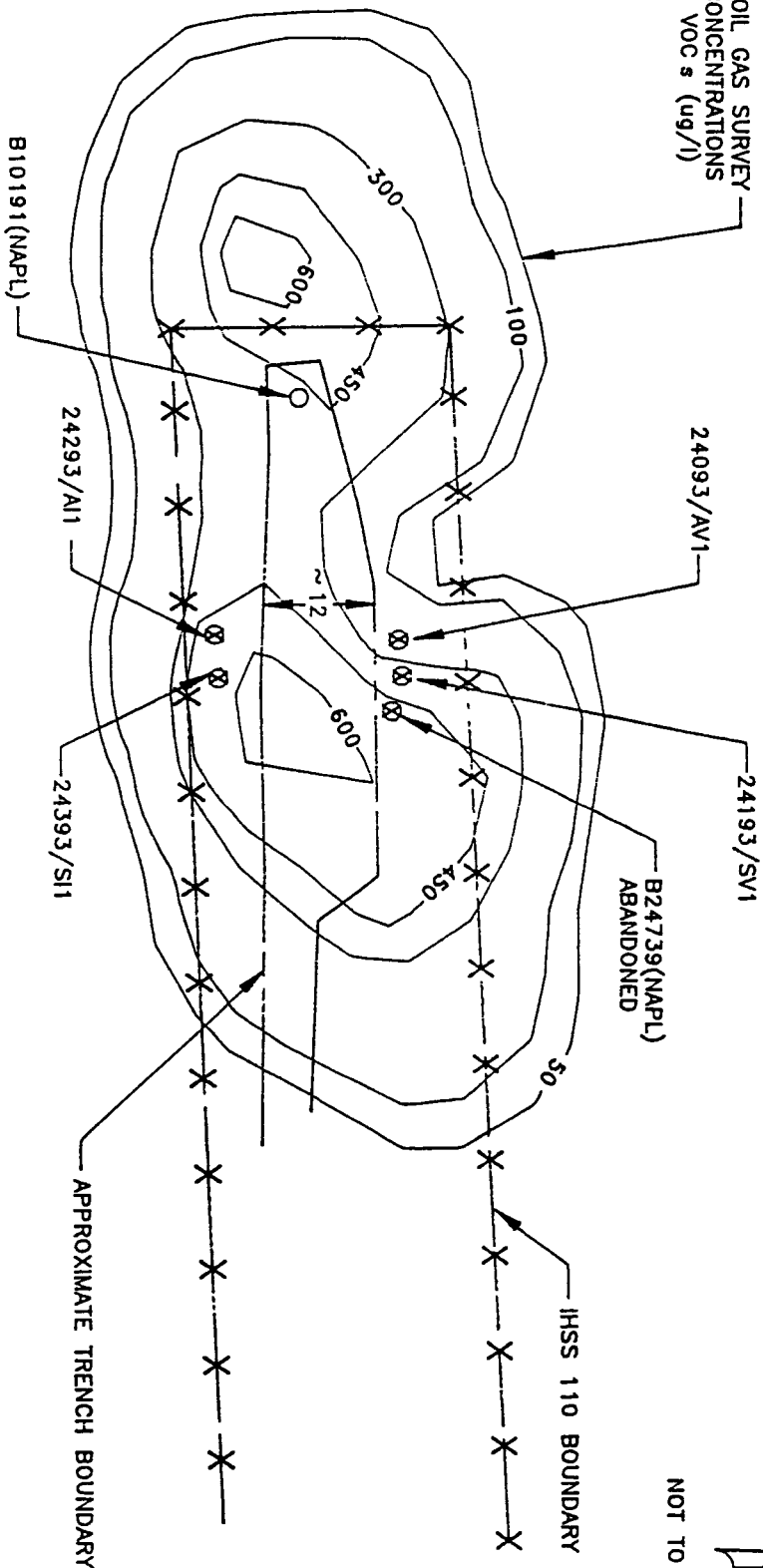
U.S. DEPARTMENT OF ENERGY  
Rocky Flats Plant Golden Colorado

OPERABLE UNIT 2  
SUBSURFACE IM/IRA SITE 1  
TECHNICAL MEMORANDUM NO 1

SVE SITE LAYOUT  
JHSS 110

FIGURE 2.5.1 JANUARY 1994

ASI SOIL GAS SURVEY  
ISO CONCENTRATIONS  
TOTAL VOC's (ug/l)



# NOTES

- BORE HOLE LOCATION - RI PHASE II 12/91
- ⊗ SVE EXTRACTIONS/INJECTION WELLS 8/93
- NAPL NON AQUEOUS PHASE LIQUIDS

U S DEPARTMENT OF ENERGY  
R ky f i l P l n t G l d n C l r d o

OU2 IHSS 110  
APPROXIMATE TRENCH AND  
BORING LOCATIONS

11/4/93

4043-110

# OU/2 SUBSURFACE IN/IRA PRELIMINARY DATA TABLE

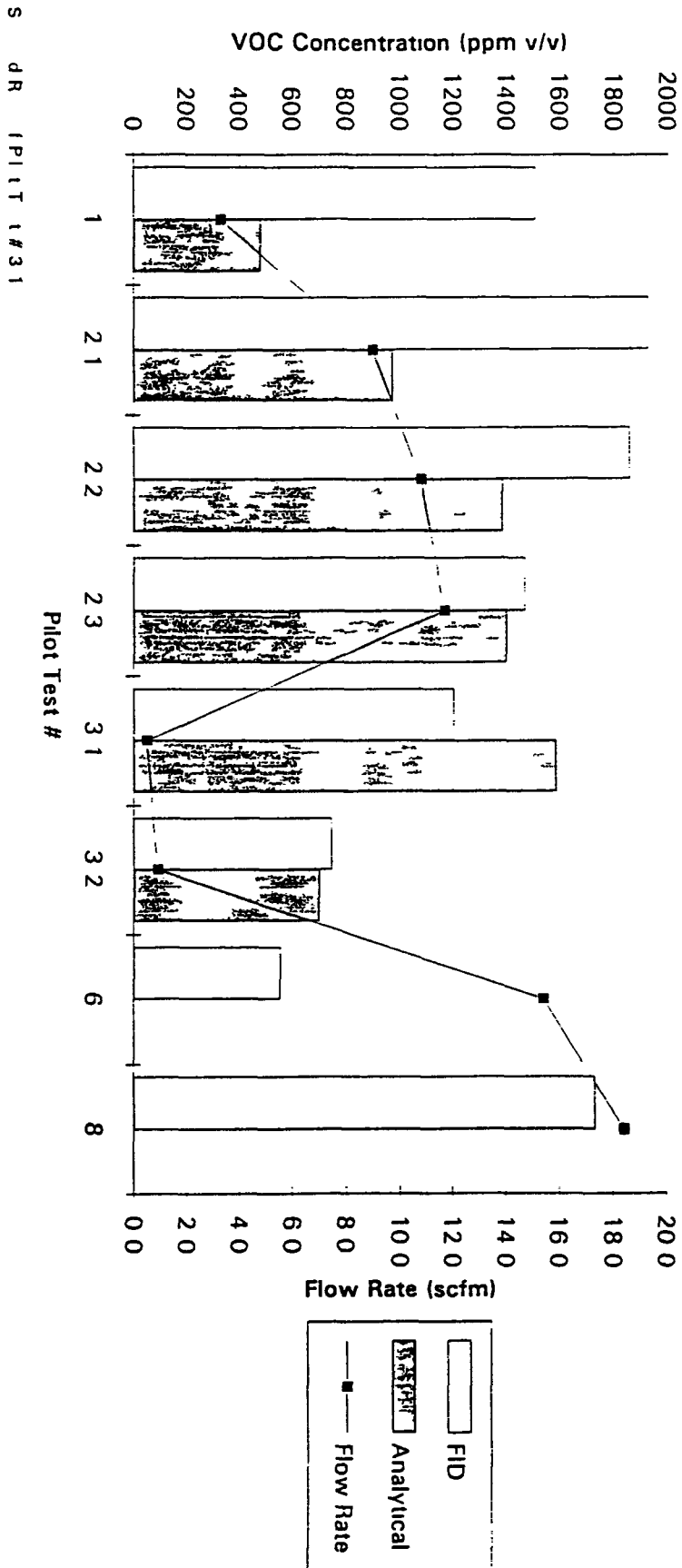
PILOT TEST NO	AVERAGE VOC CONCENTRATION (ppm v/v)	AVERAGE VOC CONCENTRATION ANALYTICAL (ppm v/v)	AVERAGE FLOW RATE (scfm)	AVERAGE VOC REMOVAL RATE (1 ID) (Q(lbs/hr))	AVERAGE VOC REMOVAL RATE (ANALYTICAL) (Q(lbs/hr))	HOURS OF OPERATION	VOC REMOVED (1 ID) (lbs)	VOC REMOVED (ANALYTICAL) (lbs)	AVERAGE WTL HEAD VACUUM (inches of water)
1	1506	482 *	3.3	0.13	0.04	4	0.5	0.2	100
2.1	1928	975	2.0	0.46	0.23	16	7.4	3.7	66
2.2	1860	1386	10.8	0.53	0.40	16	8.5	6.4	102
2.3	1470	1402	11.7	0.46	0.44	23	10.3	9.8	138
3.1 **	1204	1587	0.5	0.02	0.02	32 ***	0.5	0.7	113
3.2	745 *****	700	0.2	0.02	0.02	16	0.3	0.3	140
4.1	Being Evaluated	Not received	0.10	NA	0.00	16	NA	Not received	100
4.2	Being Evaluated	Not received	0.20	NA	0.00	16	NA	Not received	140
6	556 *****	Not received	15.4	0.23	NA	16	3.6	Not received	140
8	1733	Not received	18.4	0.85	NA	16	13.6	Not received	140

LBS  
VOCS = 44.7 21.0

- \* Pilot Test No. 1 analytical data from Job did not include 1 CL
- \*\* Second run of pilot test No. 3.1
- \*\*\* Hours include first run of Pilot Test 3.1
- \*\*\*\* Flow distribution indicated actual 1 ID readings may be higher



# Total VOC Concentration and Soil Gas Flow Rate



# **OU 2 SOIL VAPOR EXTRACTION GROUNDWATER GENERATION**

PILOT TEST	HRS	GPM	TOTAL VOLUME
3 1	32	4 1	7800
3 2	16	4 2	4000
Pump Test	24	3 1	4500
4 1	16	7 3	7000
4 2	16	5 5	5280

**OU 2 SOIL VAPOUR EXTRACTION PILOT TEST  
GROUNDWATER ANALYSIS SUMMARY**

DATE	SAMPLE ID	LOCATION ID	CCl4 (ppb)	PCE (ppb)	TOTAL ORGANICS (ppb)
10/22/93	VE20001WC	21193	230	220	450
10/26/93	VE20005WC	24393	3000	740	3740
03/07/94	VE20009WC	SV00394	1600	1900	3500
03/08/94	VE20010WC	SV00394	1800	3200	5000
03/09/94	VE20012WC	TK 2202	1200	2000	3200
03/11/94	VE20011WC	SV00394	1500	3800	5300
03/11/94	VE20013WC	TK 2201	1000	1600	2600
		low	230	220	450
		hi	1800	3800	5600
		ave	1420	2500	3920

*450 upgradient well  
3740 down gradient well*

## **Review of Technical Memorandum No 1 Issues**

- Inlet Soil Gas Concentrations and Flowrates
- Operating Pressures - max - 140 in Water Column
- Potential DNAPL at the Groundwater Table
- GAC Usage

## SUMMARY VOC REMOVAL

<b>Test Programs</b>	<b>Hours of Operation</b>	<b>Average Soil Gas Extraction Rate (scfm)</b>	<b>Estimate Total lbs VOC Removed</b>
Alluvial	91	12.5	44
Sandstone	80	0.2	1
Extended Ops (Alluvial)	40	20	28
Total	211		73

# ESTIMATE SVE GAC USAGE

VOC Concentration (ppm v/v)	VOC Concentration (µg/l)	VOC lb/hr @ 20 scfm	Hours to Exhaust 1800 lbs of GAC	
			5% loading (90 lbs VOC)	25 % loading (450 lbs VOC)
1 000	6 795	0 51	176	882
2 000	13 590	1 02	88	441